Remarks

Claims 22-26, 28-30, 32-36, 38-49 and 51-64 are active in the present application.

Applicant's undersigned representative thanks Examiner Wong for the careful examination of the previously pending claims, the detailed explanations in the Office Action dated June 15, 2007, and the helpful and courteous discussion held with the undersigned on August 16, 2007. Applicant submits herewith the Declaration of Jonathan Liou under 37 C.F.R. 1.132, in accordance with one of the options discussed on August 16, 2007. The Declaration explains the advantages of allocating a target frame bit rate among the plurality of objects in the frame in accordance with and/or in proportion to an average pixel value for the object, as recited in the present Claims 22, 29 and 32 (see, e.g., paragraphs 12-14 of the attached Declaration). Also, the Declaration analyzes the differences between the approaches of the present claims and the cited references ("tops down" vs. "bottoms up," respectively; see paragraph 17 of the attached Declaration), and discusses the advantages of the claimed approach relative to that of the primary cited reference (see, e.g., paragraph 28 of the attached Declaration). Consequently, the attached Declaration of Liou supports patentability of the present claims. The following remarks shall further summarize and expand upon topics discussed.

The present invention relates to a method for allocating bits to encode each frame of an image sequence, where each frame has a plurality of objects. The invention further relates to an apparatus for encoding each frame of such an image sequence, as well as a computer-readable medium having stored thereon a plurality of instructions which, when executed by a processor, generally perform the steps of the method. The method (as set forth in Claim 22) generally comprises:

(a) determining a target frame bit rate, T_{frame}, for the frame in accordance with a quantizer scale for each object in the frame;

(b) allocating the target frame bit rate among the plurality of objects in accordance with the formula:

$$V_i = K_i \times T_{frame}$$

where V_i is a target object bit rate for each object, and K_i is proportional to an average pixel value for the object;

(c) generating the quantizer scale for each of the objects in accordance with the target object bit rate, wherein the quantizer scale provides coarser and/or fewer allowed quantization values for a high frequency subband of the image sequence than for a low frequency subband of the image sequence; and

(d) recursively adjusting the target frame bit rate for each frame in the sequence.

In further embodiments, the present invention relates to a computer-readable medium (containing instructions generally to perform the present method; see Claim 32), and an apparatus for encoding each frame of an image sequence. The apparatus (as set forth in Claim 29) generally comprises:

(a) a motion compensator for generating a predicted image of a current frame;

(b) a transform module for applying a transformation to a difference signal between the current frame and the predicted image, where the transformation produces a plurality of coefficients;

(c) a quantizer for quantizing the plurality of coefficients with at least one quantizer scale; and

(d) a controller for generating the quantizer scale(s) for each of the objects in accordance with the target object bit rate, the quantizer scale(s) providing coarser and/or fewer allowed quantization values for a high frequency subband of the image sequence than for a low frequency subband of the image sequence, selectively adjusting the one quantizer scale(s) for a current frame in response to a target object bit rate for each of the plurality of objects, and determining the target object bit rate from a target frame bit rate in accordance with the formula:

$$V_i = K_i \times T_{frame}$$

where V_i is a target object bit rate for each object, and K_i is proportional to an average pixel value for the object.

The primary reference cited against the claims (Eleftheriadis et al., U.S. Pat. No. 6,055,330 [hereinafter "Eleftheriadis"]) does not disclose or suggest allocating a target frame bit rate among the objects in a frame in accordance with the formula $V_i = K_i \times T_{frame}$, nor does Eleftheriadis et al. disclose or suggest allocating the target frame bit rate among the objects according to ***an average pixel value*** for the object (see Claims 22 and 32). Furthermore, Eleftheriadis does not disclose a controller for determining the target object bit rate from a target frame bit rate in accordance with the formula $V_i = K_i \times T_{frame}$, where K_i is an average pixel value for the object (see Claim 29). The attached Declaration of Liou explains the differences between the independent claims and the disclosures of the cited references, the advantages provided by the independent claims relative to the technology disclosed by the cited references, and the reasons why the differences are unexpected in view of the cited references. Consequently, the present claims are patentable over the cited references.

The Rejection of Claims 22-24, 27-30, 32-34 and 38 under the Judicially Created Doctrine of Double Patenting

As mentioned in the Amendment filed April 23, 2007, a new limitation was added to each independent claim, relating to generating a quantizer scale that provides coarser and/or fewer allowed quantization values for a high frequency subband than for a low frequency subband of the image sequence. Neither generating a quantizer scale for each of the objects in accordance with the target object bit rate, the quantizer scale providing coarser and/or fewer allowed quantization values for a high frequency subband of the image sequence than for a low frequency subband of the image sequence, nor any obvious variation thereof, appears to be recited in any of claims 1-13 of U.S. Pat. No. 6,023,296, and it is not clear from the record or from the Office Action dated June 15, 2007 which claims are broader in scope than the other claims. At least with regard to the new limitation added on April 23, 2007, the present claims

22-24, 27-30, 32-34 and 38 are not broader in scope than claims 1-13 of U.S. Pat. No. 6,023,296. Thus, withdrawal of this ground of rejection is respectfully requested.

<u>The Rejection of Claims 22-26, 28-30, 32-36, 38-49 and 51-59 under 35 U.S.C. § 103(a)</u>

The rejection of claims 22-26, 28-30, 32-36, 38-49 and 51-59 under 35 U.S.C. § 103(a) as being unpatentable over Eleftheriadis (U.S. Pat. No. 6,055,330) in view of Klein Gunnewiek (U.S. Pat. No. 5,606,371) is respectfully traversed.

Eleftheriadis discloses a method and apparatus for performing digital image and video segmentation and compression using 3-D depth information (Title). In contrast to the present claims 22 and 32, which recite allocating the target object bit rate(s) in accordance with the target frame rate and ***an average pixel value*** for the object, Eleftheriadis appears to determine a target object bit rate based on a quantizer (the value of which appears to be related to the distance of the object from the camera; see, e.g., col. 11, ll. 1-15 and 41-44) and **the proportion of pixels in the object** (see, e.g., col. 11, l. 65-col. 12, l. 10; emphasis added). Thus, Eleftheriadis is deficient with respect to the present claims (see paragraphs 8-9 of the attached Declaration of Liou; note that paragraphs 5-7 of the attached Declaration of Liou recite the language of the present Claims 22, 29 and 32, respectively).

For example, Eleftheriadis does not disclose allocating a target frame bit rate among the objects in a frame according to ***an average pixel value*** for the object, nor does Eleftheriadis et al. appear to disclose the present step of generating a quantizer scale for each object that provides coarser and/or fewer allowed quantization values for a high frequency subband than for a low frequency subband of the image sequence (see paragraph 10 of the attached Declaration of Liou and Claims 22 and 32). While Eleftheriadis mentions the quantization of pixels and frames that comprise a plurality of objects, one benefit of the present claimed method is that the target bit rates can be prioritized based on the relative need of the objects for the available bits (as reflected by ***the average pixel value***) in a given application, rather than on the size of the objects (see paragraph 10 of the attached Declaration of Liou). Furthermore, Eleftheriadis does not

disclose a controller for generating such a quantizer scale and determining the target object bit rates from a target frame bit rate in accordance with an average pixel value for the objects (see paragraph 11 of the attached Declaration of Liou and Claim 29).

Allocating a target frame bit rate among the objects in a frame according to ***an average pixel value*** for the object is advantageous because it provides more efficient use of encoder bandwidth relative to determining an object bit rate according to the frame bit rate and the number of pixels in the object, as taught by Eleftheriadis (see paragraph 12 of the attached Declaration of Liou). In combination with generating the quantizer scale for each object in accordance with the target object bit rate, allocating a target frame bit rate among the objects in a frame according to ***an average pixel value*** for the object enables objects of interest to receive a higher bit rate than objects of lesser interest, regardless of the number of pixels in (or size of) the object (see paragraph 13 of the attached Declaration of Liou).

One advantage of the method (e.g., recited in the present Claims 22 and 32) is that an object having a smaller number of pixels, but needing more bits (e.g., in terms of encoding syntax information, motion information and/or shape information; see, e.g., page 14, lines 2-7 of the present specification) can have a greater proportion of the available bandwidth, or target frame bit rate, than a larger object that does not need as many bits. In contrast, the approach of Eleftheriadis appears to assign a certain proportion of the available frame bandwidth based solely on the size of the object, without reference to the relative need for encoding bits by the various objects in the frame (see paragraph 14 of the attached Declaration of Liou).

As a result, the present Claims 22, 29 and 32 are not disclosed, nor are the advantages and benefits thereof suggested, by Eleftheriadis. Klein Gunnewiek fails to cure these deficiencies of Eleftheriadis.

Klein Gunnewiek discloses a device for encoding a video signal comprising means for dividing each picture into a plurality of sub-pictures, an encoder comprising a picture transformer for transforming each sub-picture into coefficients, and a quantizer for quantizing the coefficients with an applied step size (col. 1, ll. 5-10). Klein Gunnewiek is silent with regard to allocating or determining an object bit rate according to an average pixel value of the object

(see paragraph 15 of the attached Declaration of Liou). Furthermore, Klein Gunnewiek neither discloses nor suggests generating a quantizer scale for each of the objects in accordance with the target object bit rate, the quantizer scale providing coarser and/or fewer allowed quantization values for a high frequency subband than for a low frequency subband of the image sequence. Consequently, Klein Gunnewiek fails to cure the deficiencies of Eleftheriadis with regard to allocating the target frame bit rate among the objects in each frame in accordance with an average pixel value for the object, or the advantages and benefits provided thereby.

Furthermore, allocating a target frame bit rate among objects in the frame, as recited in Claims 22, 29 and 32, is not disclosed by Eleftheriadis (see paragraph 17 of the attached Declaration of Liou). Instead, Eleftheriadis determines object bit rates, adds them up, then adjusts the total frame bit rate based on buffer fullness (see the discussion below and in the attached Declaration of Liou). Thus, Eleftheriadis takes a "bottoms up"-type approach to determining object and frame rates, whereas the method, apparatus and medium of the present Claims 22, 29 and 32 use a "tops down"-type of approach (see paragraph 17 of the attached Declaration of Liou).

For example, Eleftheriadis discusses two coding techniques for controlling bit rates, variable bit rate (VBR) coding and constant bit rate (CBR) coding (see col. 8, ll. 8-19 and col. 11, ll. 39-64). Eleftheriadis discloses a constant bit rate encoder (FIG. 10), in which an object map generated by object segmentation circuit 500 is received by a macroblock labeling circuit 1100 (see col. 10, l. 65-col. 11, l. 1). Since the encoder splits each frame of video information received from the camera into macroblocks and quantizes DCT coefficients on a macroblock basis, Eleftheriadis teaches that it is desirable to assign each macroblock of video data to a specific object, or in the case of a simple segmentation technique described therein, to a region which contains one or more objects at the same depth from the camera (col. 11, ll. 1-8). Once the macroblock including pixels from an object or region has been assigned, it will be assigned to one object or region by macroblock labeling circuit 1100, a rate controller 1040 can select an appropriate quantizer step size for the entire current macroblock (col. 11, ll. 12-15; see also paragraph 18 of the attached Declaration of Liou).

For CBR coding, as disclosed by Eleftheriadis, the rate controller 1040 must additionally regulate quantizer selection so that the output buffer 1020 neither overflows nor underflows. ***Since the total number of bits per second which may be output is now fixed***, object sizes become important (col. 11, ll. 53-57; emphasis added in the Declaration). In accordance with a known technique for performing arca-selective rate control when the object locations are known, each object is associated with a particular target average bit rate R_i, except for the background (object n). Thus, in CBR coding, Eleftheriadis appears to determine a target object bit rate based on a quantizer value, rather than an allocation in accordance with the target frame rate, as recited in the present Claims 22, 29 and 32 (see paragraph 19 of the attached Declaration of Liou).

In order to maintain the given total average rate R necessary to prevent buffer overflow, the background rate is determined according to EQ. (4) in Eleftheriadis:

$$\sum_{i=0}^{n} a_i R_i = R \qquad (4)$$

where α_i is the proportion (from 0.0 to 1.0) of the pixels in the frame that belong to object i (col. 11, l. 67-col. 12, l. 10; see also paragraph 20 of the attached Declaration of Liou). Thus, in confirmation of the first difference between the present claims and Eleftheriadis, Eleftheriadis clearly determines a target object bit rate based on the proportion of pixels in the object, rather than ***an average pixel value*** for the object, as explained above (see paragraph 21 of the attached Declaration of Liou).

Eleftheriadis explicitly teaches that it is possible that R_n (the background bit rate) is negative (col. 12, l. 16). ***To one of ordinary skill in the art, this possibility of a negative background bit rate demonstrates that target object bit rates are not allocated in accordance with a target frame rate*** (emphasis added). Rather, they must be determined by some other technique (such as in accordance with a quantizer value, as explained above, which in turn appears to be based on the occupancy B_{max} of a buffer [col. 13, ll. 22-26], the output rate of which is constant and dependant on the bandwidth of the channel which is accepting data from the buffer; see col. 13, ll. 17-22; see also paragraph 22 of the attached Declaration of Liou). Eleftheriadis further teaches that the possibility of a negative background bit rate may simply

have the effect of assigning as coarse quantization as possible to the background, and may result in less average bits per second per object than the target bit rates R_i indicate (col. 12, l. 16-19), further confirming that ***target*** object bit rates therein are not allocated in accordance with a target frame rate (see paragraph 23 of the attached Declaration of Liou). .

Thus, there appears to be ***no reasonable basis in Eleftheriadis*** for an assertion ***that EQ. (4)*** of Eleftheriadis is used to ***determine the target frame rate***; to the extent R may be related to a target frame rate, Eleftheriadis teaches that it is given (e.g., determined *a priori*, and dependent on the bandwidth of the channel which is accepting data from the buffer; see paragraph 24 of the attached Declaration of Liou, emphasis added). Furthermore, the rate control performed by placing a buffer 320 at the output 310 of the variable bit rate (VBR) encoder 200 and having (and/or using) a rate controller 340 takes into account the occupancy of the buffer and other parameters that are possibly signal dependent in order to decide the quantizer step size in quantizer 251, so that the buffer does not overflow or underflow (col. 8. ll. 17-27, and Fig. 2-3). Consequently, in the relevant discussion of CBR coding, Eleftheriadis fails to disclose step of allocating the target frame bit rate in accordance with a target object bit rate as recited in the method, apparatus and computer-readable medium of the present Claims 22, 29 and 32 (see paragraph 24 of the attached Declaration of Liou).

Also, as discussed above, since Eleftheriadis teaches that the frame bit rate is related to the occupancy of a buffer having a constant output rate that is, in turn, dependent on the bandwidth of the channel which is accepting data from the buffer, Eleftheriadis cannot disclose or suggest to one of ordinary skill in the art that the frame bit rate can be (much less should be) adjusted. Thus, Eleftheriadis appears to be silent with regard to recursively adjusting a target frame rate, as recited in the present Claims 22 and 32 (see paragraph 25 of the attached Declaration of Liou).

For VBR coding, Eleftheriadis teaches that macroblock labels can be directly used for rate control by associating particular quantizer step sizes with each object (col. 11, ll. 39-41). The encoder can also employ techniques to "smooth out" quantizer differences at object boundaries by gradually changing the quantization step while entering or exiting an object (col.

11, ll. 47-50). A macroblock labeling circuit 1100 (see FIG. 11) contains object identifications for each pixel in the macroblock (col. 11, ll. 16-19), and quantizer selection is simply a lookup operation into a table which indexes the possible object identifications generated by macroblock labeling circuit 1100 (col. 11, ll. 44-47). Also, Eleftheriadis teaches that rate control is also usable in a purely VBR encoder to provide higher quality for some image areas, and less for areas that have smaller significance (e.g., background areas). As a result, the term rate control is used by Eleftheriadis generally without discriminating whether or not a CBR or VBR encoder is used (col. 8, ll. 40-47). Thus, the discussion of VBR coding by Eleftheriadis fails to cure any deficiency of Eleftheriadis with regard to the allocating step in the present Claims 22 and 32 (see paragraph 26 of the attached Declaration of Liou). Consequently, Eleftheriadis fails to disclose allocating the target frame bit rate among a plurality of objects in the frame in accordance with an average pixel value for the object, as recited in the present Claims 22 and 32 (see paragraph 27 of the attached Declaration of Liou).

<u>Allocating the target frame bit rate among a plurality of objects in the frame provides for more efficient use of encoder bandwidth and reduces the risk of buffer overruns, relative to the approach of Eleftheriadis</u> (which can assign or allow a total of the object bit rates that is greater than the total bit rate for the frame). ***Reducing the risk of buffer overruns also reduces the probability of skipping frames, which can affect the quality of a digital video picture stream*** (see paragraph 28 of the attached Declaration of Liou; emphasis added). As a result, Eleftheriadis does not disclose or suggest the advantages and/or benefits of allocating the target frame bit rate among the plurality of objects in the frame, as recited in the present Claims 22 and 32.

Furthermore, Eleftheriadis fails to disclose the controller of the present Claim 29, which determines the target object bit rate from a target frame bit rate in accordance with an average pixel value for each of the objects. As discussed above, Eleftheriadis determines a target object bit rate based on ***the proportion of pixels in the object***, rather than an average pixel value for the object. In addition, Eleftheriadis discloses a rate controller 1040 that regulates quantizer selection so that the output buffer 1020 neither overflows nor underflows (col. 11, ll. 53-57).

However, the output rate of the buffer is constant and dependant on the bandwidth of the channel which is accepting data from the buffer (see col. 3, ll. 17-26). Eleftheriadis does not appear to disclose any connection between the bandwidth of the channel which is accepting data from the buffer and a target frame bit rate. As a result, Eleftheriadis is deficient with regard to the method recited in Claims 22 and 32 (see paragraph 29 of the attached Declaration of Liou), as well as the controller of Claim 29.

Klein Gunnewiek fails to cure the deficiencies of Eleftheriadis with regard to allocating the target frame bit rate among the plurality of objects in the frame, or the advantages and benefits provided thereby.

Klein Gunnewiek discloses a device for encoding a video signal comprising means for dividing each picture into a plurality of sub-pictures, an encoder comprising a picture transformer for transforming each sub-picture into coefficients, and a quantizer for quantizing the coefficients with an applied step size (col. 1, ll. 5-10). Klein Gunnewiek neither discloses nor suggests allocating a target frame bit rate among the object(s) in a frame according to an average pixel value for the object, nor does Klein Gunnewiek disclose or suggest generating a quantizer scale for each of the objects in accordance with the target object bit rate, the quantizer scale providing coarser and/or fewer allowed quantization values for a high frequency subband than for a low frequency subband of the image sequence (see paragraph 30 of the attached Declaration of Liou).

There is no reasonable basis for interpreting either cited reference (Klein Gunnewiek or Eleftheriadis) as disclosing a target object bit rate determined and/or based on ***an average pixel value***. The constant values K_P and K_B of Klein Gunnewiek are not average pixel values, regardless of how they may be applied in an equation. Instead, they are constants that are related only to the gain of the encoder and the quantizer step size (col. 3, ll. 11-15, and col. 4, l. 44-col. 5, l. 10 of Klein Gunnewiek). Thus, the constant values K_P and K_B of Klein Gunnewiek are constants of the system, and are arguably not related to ***pixel values*** at all (see paragraph 31 of the attached Declaration of Liou).

As a result, the average pixel value K_i as recited in Claims 22, 29 and 32 has a different nature (e.g., it is a variable) than K_P and K_B of Klein Gunnewiek (which are constants), and it is not an obvious design choice or variation to one of ordinary skill in the art to substitute an object-based variable for a constant of the system (see paragraph 32 of the attached Declaration of Liou).

Thus, Klein Gunnewiek fails to cure the deficiencies of Eleftheriadis with respect to allocating the target frame bit rate among the objects in each frame in accordance with an average pixel value for the object, as recited in the present Claims 22 and 32. Similarly, Klein Gunnewiek fails to cure the deficiencies of Eleftheriadis with respect to a controller for doing the same, as recited in the present Claim 29. Consequently, no possible combination of Eleftheriadis and Klein Gunnewiek can suggest the method, apparatus and computer-readable medium of the present Claims 22, 29 and 32 (see paragraph 33 of the attached Declaration of Liou).

Stone does not cure the deficiencies of Eleftheriadis and Klein Gunnewiek with regard to the method, apparatus and computer-readable medium of Claims 22, 29 and 32 (see paragraph 34 of the attached Declaration of Liou).

Stone discloses compressing a digital video signal by spatial sub-band filtering to form data sets constituting respective sub-bands of the two-dimensional spatial frequency domain (Abstract, ll. 1-3). The data sets for a field or frame are stored, and a first sequencer controls writing the stored data to a quantizer in which they are quantized in accordance with respective values, those values being such that the amount of quantization of at least a data set constituting a sub-band to which dc luminance information of the signal is at least predominantly confined is less than the average of the amounts of quantization of the remaining data sets (Abstract, ll. 4-12; see also paragraph 35 of the attached Declaration of Liou).

Stone further discloses intra-image compression in the time domain by the use of differential pulse code modulation, in which a predictor is used to predict the values of samples representing pixels based on previous pixel values because image pixels are highly correlated, and the small and uncorrelated error can be encoded using fewer bits than the samples representing the original pixels (col. 1, ll. 27-37). Stone suggests that a selective quantization

operation and/or entropy encoding in accordance with the description therein can lead to bit rate reduction (col. 15, ll. 45-52; col. 18, ll. 39-46; and col. 20, ll. 24-46).

Stone is silent with regard to (a) allocating the target frame bit rate in accordance with a target object bit rate and/or (b) allocating a target frame bit rate among the objects in each frame in accordance with ***an average pixel value*** for the object, as recited in the present Claims 22, 29 and 32 (see paragraph 37 of the attached Declaration of Liou). Thus, Stone fails to cure the deficiencies of Eleftheriadis and Klein Gunnewiek with respect to the method, controller and computer-readable medium of Claims 22, 29 and 32. Consequently, no possible combination of Eleftheriadis, Klein Gunnewiek and Stone can suggest the method, apparatus and computer-readable medium of the present Claims 22, 29 and 32 (see paragraph 38 of the attached Declaration of Liou).

As a result, this ground of rejection is unsustainable, and should be withdrawn.

The Rejection of Claims 32-36, 38, 56-59 and 63-64 under 35 U.S.C. § 101

The rejection of Claims 32-36, 38, 56-59 and 63-64 under 35 U.S.C. § 101 is respectfully traversed.

The examples provided in the Office Action to explain why Claims 32-36, 38, 56-59 and 63-64 are directed to non-statutory subject matter are not persuasive and/or not encompassed by the claims. This ground of rejection is not well-understood.

The first example of purportedly non-statutory subject matter encompassed by Claims 32-36, 38, 56-59 and 63-64 is paper on which the program is written. First, paper is patentable subject matter under 35 USC § 101, since there are undoubtedly thousands of patents on various forms of paper, with or without instructions "stored" thereon. However, looking beyond the issue of whether paper is patentable subject matter (which it is), if the first example provided in the Office Action (paper on which the instructions are written) is capable of being read by a computer and having the instructions written thereon executed by processor, then the paper <u>is</u> a computer-readable medium having a set of instructions stored thereon that perform the recited

method when executed by a processor. The paper, like any other computer-readable storage medium (e.g., random access memory [RAM], flash memory, hard drives, CD-ROMs, etc.), clearly has utility (e.g., when used with a computer or other processing device capable of reading and executing the instructions thereon). It is made "using the hand of man" and is thus an article of manufacture. Consequently, insofar as the rejection can be understood, it appears to be based on the scope of the claims being broad enough to read on one example of an article of manufacture (i.e., a sheet of paper "storing" computer-readable and executable instructions thereon) that has utility in data communications, but which the Office believes to be non-statutory subject matter, whereas other articles of manufacture (e.g., a hard disk, RAM, flash memory, etc., containing code therein) having the same utility would presumably be patentable. In this context, the sheet of paper would be a computer component, the same as any other computer-readable medium.

Either subject matter falls within 35 USC § 101 or it does not, as the scope of the claims is not relevant to subject matter eligibility. Claimed subject matter does not take on different eligibility status with variations or adjustments in scope of proposed claim. See *SmithKline Beecham Corp. v. Apotex Corp.*, 365 F.3d 1306, 70 USPQ2d 1737 (2004 Fed. Cir.), vacated, remanded, on reh. 403 F3d 1328, 74 USPQ2d 1398 (2005 Fed. Cir.) and superseded 403 F3d 1331, 74 USPQ2d 1396 (2005 Fed. Cir.). How one article of manufacture that has a particular utility is non-statutory subject matter, while another article of manufacture having the same utility and encompassed by the same claim is statutory, is not consistent with proper legal interpretation of 35 USC § 101 and is not understood.

Alternatively, if we are to take the assertion that paper storing instructions thereon that can be read and code stored thereon executed by a signal processing device is not statutory under 35 USC § 101, perhaps it is not statutory for another reason. For example, the Examiner may have made certain unstated assumptions or overlooked certain language of the claims. While it certainly is plausible that a computer can scan a sheet of paper. However, when that sheet of paper contains a visual representation of the instructions, for the sheet of paper to not be a computer component, the instructions on the paper presumably are not the instructions that the

processor can execute. The non-executable instructions on the paper would presumably be converted into executable instructions before the processing device executes them, if the example of non-statutory "paper storing instructions thereon" is to be taken at face value. In this sense, the paper storing instructions thereon would not be statutory because it does not include the instructions that, when executed by a processor, would provide the paper with utility. Such paper is not encompassed by the present claims, which require that the computer-readable medium store instructions which, when executed by a processor, perform a recited method.

Thus, either paper contains executable instructions or it does not. In the first case, the paper has utility like any other form of computer-readable memory, and the rejection is unsustainable. In the second case, the paper does not have utility, but it is not encompassed by the claims. Accordingly, this basis for rejection is legally and technically untenable, and should be withdrawn.

The second example provided in the Office Action (a program simply contemplated and memorized by a person) is not a medium capable of being read by a computer and having the instructions written thereon executed by processor. As far as the undersigned is aware, computers are not telepathic. It is not known by the undersigned how a computer can read (and a processor execute) information stored in a person's brain without some kind of transmission, translation or other intervening activity.

On the other hand, the program contemplated and memorized by a person **can** become computer-readable once the person enters the instructions into the computer and the computer stores them in a physical memory to which the computer has access. At that point, the computer-readable instructions are the instructions stored in physical memory accessible by the computer. That physical memory having computer-readable instructions stored therein is without doubt patentable subject matter under 35 U.S.C. 101. The program contemplated and memorized by a person is simply not a computer-readable medium as set forth in the present claims.

Accordingly, this ground of rejection is unsustainable, and should be withdrawn.

Conclusions

In view of the above amendments and remarks, all bases for rejection are overcome, and the application is in condition for allowance. Early notice to that effect is earnestly requested.

If it is deemed helpful or beneficial to the efficient prosecution of the present application, the Examiner is invited to contact Applicant's undersigned representative by telephone.

Respectfully submitted,

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